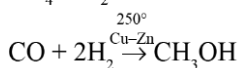
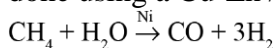


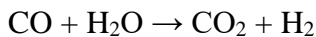
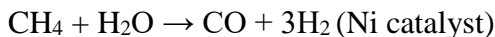
## ANSWERS: Synthesis of methanol

1. Methanol is made from methane in a two (or three) step process.

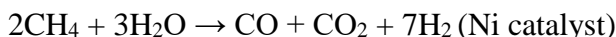
The first reaction is done at high temperatures (over 800°C) using a nickel catalyst, while the last reaction is done using a Cu-Zn / Cu / Pt catalyst.



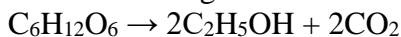
OR



OR



Ethanol is made by a process of fermentation, which involves the conversion of a solution of sugar molecules (in water) into ethanol and carbon dioxide in warm, anaerobic conditions using yeast as a catalyst. Yeast is a living organism and requires warmth and moisture to carry out fermentation. Yeast metabolises / converts the sugars into alcohol when there is a lack of oxygen.

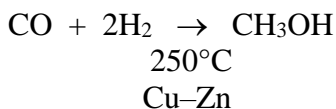
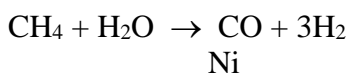


**How do they differ?**

The production of ethanol is a one-step process, whereas the production of methanol involves more than one step.

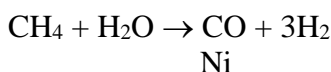
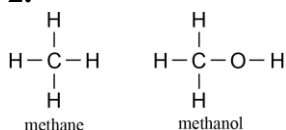
They both involve the use of catalysts, but to produce ethanol it is yeast, a living organism. To produce methanol, a metal (non-living) catalysts is used.

The production of methanol requires high temperatures, but for ethanol it requires warm and anaerobic conditions.



*(Catalysts and heat are not required in the equations).*

2.



*(Catalysts and heat are not required in the equations).*

